

Remarks

Claims 1-3, 5-7, 9, 12-14, and 16-17 were rejected by the Examiner under 35 U.S.C. § 103(a) as being unpatentable over Marcantonio (U.S. Patent No. 5,796,170, hereinafter "Marcantonio"). Claims 4, 8, 10, 11, 15, 18 and 19 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Examiner objected to Claim 8 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant has adopted Examiner's suggestions. Claim 1 has been amended to contain the limitation of Claim 8. Claim 8 has been deleted. Claim 15 has been amended to eliminate language which is redundant in light of the amendment made to Claim 1. Claim 53 has been added, which rewrites Claim 11 in independent form.

With these amendments, it is respectfully submitted that Claim 1, as amended, defines patentable subject matter as determined by the Examiner. Applicants further submit that Claims 2, 3, 5-7, 9, 12-14, and 16-17 which are dependent from amended Claim 1 define patentable subject matter and are now in condition for allowance. Further, Applicants submit that Claims 4, 8, 10, 11, 15, 18 and 19 are now dependent from a patentable independent claim, and are in condition for allowance. Claims 20-52 were allowed over the prior art of record. Applicants thank the Examiner for the allowance of these claims. In view of the amendments herein, Applicants respectfully submit that all of Applicants' claims currently on file are in condition for allowance. Such allowance at an early date is respectfully requested.

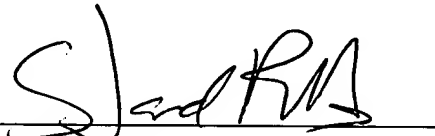
Applicants hereby declare that any amendments herein that are not specifically made for the purpose of patentability are made for other purposes, such as clarification, and that no such changes shall be construed as limiting the scope of the claims or the application of the Doctrine of Equivalents.

The amendments herein added one new independent claim, resulting in an additional fee of \$80.00 being due. Please charge IBM Corp Deposit Account No. 09-0458. If any additional fees, including extension of time fees, are due as a result of this response, please charge the above-mentioned Account No. This authorization is intended to act as a constructive petition for an extension of time, should an extension of time be needed as a result of this response. The Examiner is invited to telephone the undersigned if this would in any way advance the prosecution of this case.

Respectfully submitted,

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By



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VERSION OF ALL CLAIMS WITH MARKINGS TO SHOW CHANGES MADE

- Claim 1. (Twice Amended) A package for containing electronic components, the package comprising:
a first circuitized card;
a second circuitized card;
an interposer interposed between the first and second circuitized cards, the interposer [comprising a circuitized card] having an opening, the opening of the interposer and the first and second circuitized card forming a cavity for containing at least one electronic component
wherein the first circuitized card has a bottom surface and there is at least one component mounted to the bottom surface.
- Claim 2. (Unchanged) The package of claim 1 wherein the interposer, first circuitized card and second circuitized card act as a Faraday shield for electronic components placed inside the cavity.
- Claim 3. (Unchanged) The package of claim 2 wherein the interposer has at least one connection to at least one ground.
- Claim 4. (Unchanged) The package of claim 3 wherein the at least one connection is a multiplicity of connections to the at least one ground, the distance between a connection and its closest neighboring connection being approximately equal.
- Claim 5. (Unchanged) The package of claim 1 wherein the opening is square and is in the approximate center of the interposer.
- Claim 6. (Unchanged) The package of claim 1 wherein the interposer is electrically and physically connected to the first and second circuitized cards.
- Claim 7. (Unchanged) The package of claim 1 wherein the first circuitized card has a top surface and there is at least one component mounted to the top surface.
- Claim 8. (DeleteD) [The package of claim 1 wherein the first circuitized card has a bottom surface and there is at least one component mounted to the bottom surface.]
- Claim 9. (Unchanged) The package of claim 1 wherein the second circuitized card has a top surface and there is at least one component mounted to the top surface.
- Claim 10. (Unchanged) The package of claim 1 wherein the second circuitized card has a bottom surface and there is at least one component mounted to the bottom surface.
- Claim 11. (Unchanged) The package of claim 1 wherein the interposer, first circuitized card, and second circuitized card are circuitized multi-layer organic laminate cards.

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Claim 12. (Unchanged) The package of claim 1 wherein the second circuitized card has a bottom surface and the bottom surface has a ball grid array allowing connection to a system board.

Claim 13. (Unchanged) The package of claim 6 wherein the first circuitized card and interposer are connected through surface mount or through-hole technologies and wherein the interposer and the second circuitized card are connected through surface mount or through-hole technologies.

Claim 14. (Unchanged) The package of claim 13 wherein the interposer and first circuitized card are connected through a ball grid array and the interposer and the second circuitized card are connected through a ball grid array.

Claim 15. (Amended) The package of claim 1 wherein the first circuitized card has a top surface [and a bottom surface], the second circuitized card has a top surface and a bottom surface, and there is at least one component on the top surface of the first circuitized card, [there is at least one component the bottom surface of the first circuitized card], and there is at least one component on the top surface of the second circuitized card.

Claim 16. (Unchanged) The package of claim 1 wherein at least one component is mounted to the first circuitized card and wherein the at least one component is attached to a heat sink or pick-up plate.

Claim 17. (Unchanged) The package of claim 1 wherein the cavity contains at least one component.

Claim 18. (Unchanged) The package of claim 17 wherein the at least one component inside the cavity is attached to a bottom surface of the first circuitized card or a top surface of the second circuitized card and wherein the at least one component is attached to the bottom surface of the first circuitized card or the top surface of the second circuitized card through surface mount attachment, direct chip attachment or through-hole attachment.

Claim 19. (Unchanged) The package of claim 1 wherein the first circuitized card has a top surface and there is at least one component attached to the top surface of the first circuitized card through surface mount attachment, direct chip attachment or through-hole attachment.

Claim 20. (Twice Amended) A package for containing electronic components, the package comprising:

a first circuitized card having a top surface and a bottom surface;
a second circuitized card having a top surface and a bottom surface;
an interposer having an opening, a top surface, and a bottom surface, the interposer being electrically connected to the first circuitized card and the second circuitized card through a first and second set of connections, the first set of connections being interposed between the bottom surface of the first circuitized card and the top surface of the interposer, the second set of connections being interposed between the bottom surface of the interposer and the top surface of the second circuitized card, wherein the bottom surface of the second circuitized card has a third set of connections for attaching the second circuitized card to a system card, and wherein the opening in the interposer, the bottom surface of the first circuitized card and the top surface of the second circuitized card [forming] forms a cavity for containing at least one electronic component.

Claim 21. (Unchanged) The package of claim 20 wherein the cavity contains at least one electronic component.

Claim 22. (Unchanged) The package of claim 21 wherein the at least one component inside the cavity is attached to a bottom surface of the first circuitized card or a top surface of the second circuitized card and wherein the at least one component is attached to the bottom surface of the first circuitized card or the top surface of the second circuitized card through surface mount attachment, direct chip attachment or through-hole attachment.

Claim 23. (Unchanged) The package of claim 21 wherein the first circuitized card has a top surface and there is at least one component attached to the top surface of the first circuitized card through surface mount attachment, direct chip attachment or through-hole attachment.

Claim 24. (Unchanged) The package of claim 20 wherein each set of connections of the first, second, and third sets of connections is a plurality of surface mount connections, or a plurality of through-hole connections.

Claim 25. (Unchanged) The package of claim 24 wherein each set of connections of the first, second, and third sets of connections is a ball grid array.

Claim 26. (Unchanged) The package of claim 20 wherein the interposer acts as a Faraday shield for electronic components placed inside the cavity.

Claim 27. (Unchanged) The package of claim 26 wherein the interposer has at least one connection to at least one ground.

Claim 28. (Unchanged) The package of claim 27 wherein the at least one connection is a multiplicity of connections to the at least one ground, the distance between a connection and its closest neighboring connection being approximately equal.

Claim 29. (Unchanged) The package of claim 20 wherein the opening is square or rectangular and is in the approximate center of the interposer.

Claim 30. (Unchanged) The package of claim 20 wherein there is at least one electronic component mounted to the top surface of the first circuitized card.

Claim 31. (Unchanged) The package of claim 20 wherein there is at least one electronic component mounted to the bottom surface of the first circuitized card.

Claim 32. (Unchanged) The package of claim 20 wherein there is at least one electronic component mounted to the top surface of the second circuitized card.

Claim 33. (Unchanged) The package of claim 20 wherein the interposer has at least one electronic component on its surface.

Claim 34. (Unchanged) The package of claim 20 wherein the interposer, first circuitized card, and second circuitized card are circuitized multi-layer organic laminate cards.

Claim 35. (Unchanged) The package of claim 20 further comprising a third circuitized card and a second interposer having a second opening, wherein the third circuitized card, second circuitized card, and the second opening in the second interposer define a second cavity for containing at least one electronic component, wherein the third circuitized card is electrically connected to the second interposer through a fourth set of connections, and wherein the second interposer is electrically connected to the second circuitized card through a fourth set of connections.

Claim 36. (Amended) A method for creating a multi-level electronic package, the method comprising the steps of:

- a) connecting a first circuitized card to an interposer, the interposer having an opening; and
- b) connecting a second circuitized card to the interposer, wherein the first circuitized card, the second circuitized card, and the opening in the interposer form a cavity for containing electronic components.

Claim 37. (Unchanged) The method of claim 36 further comprising the step of placing at least one electronic component in the cavity.

Claim 38. (Unchanged) The method of claim 36 further comprising the step of grounding at least one connection to the interposer so that the interposer and the at least one connection acts as a Faraday shield.

Claim 39. (Unchanged) The method of claim 38 wherein the at least one connection is a plurality of connections, and the method further comprises the step of grounding the plurality of connections such that each ground is approximately equal in distance from its nearest neighboring ground.

Claim 40. (Unchanged) The method of claim 36 wherein the step of connecting the first circuitized card to the interposer further comprises the step of connecting the interposer and the first circuitized card through a ball grid array.

Claim 41. (Unchanged) The method of claim 36 wherein the step of connecting the second circuitized card to the interposer further comprises the step of connecting the interposer and the second circuitized card through a ball grid array.

Claim 42. (Unchanged) The method of claim 36 wherein the step of connecting the first circuitized card to the interposer further comprises the step of connecting the interposer and the first circuitized card through either a plurality of surface mount connections or a plurality of through-hole connections.

Claim 43. (Unchanged) The method of claim 36 wherein the step of connecting the second circuitized card to the interposer further comprises the step of connecting the interposer and the second circuitized card through either a plurality of surface mount connections or a plurality of through-hole connections.

Claim 44. (Unchanged) The method of claim 36 wherein the first circuitized card further comprises a top surface and wherein the method further comprises the step of mounting at least one electronic component on the top surface of the first circuitized card.

Claim 45. (Unchanged) The method of claim 36 wherein the first circuitized card further comprises a bottom surface and wherein the method further comprises the step of mounting at least one electronic component on the bottom surface of the first circuitized

card.

Claim 46. (Unchanged) The method of claim 36 wherein the second circuitized card further comprises a top surface and wherein the method further comprises the step of mounting at least one electronic component on the top surface of the second circuitized card.

Claim 47. (Unchanged) The method of claim 36 wherein the second circuitized card further comprises a bottom surface and wherein the method further comprises the step of mounting at least one electronic component on the bottom surface of the second circuitized card.

Claim 48 (Unchanged) The method of claim 36 wherein the second circuitized card further comprises a bottom surface and the method further comprises the step of attaching a ball grid array to the bottom surface of the second circuitized card for connection to a system board.

Claim 49. (Unchanged) The method of claim 48 further comprising the step of connecting the second circuitized card to a system board.

Claim 50. (Unchanged) The method of claim 44 further comprising the step of attaching a pick-up plate or heat sink to the at least one electronic component on the top surface of the first circuitized card.

Claim 51. (Amended) The method of claim 36 further comprising the following steps:
c) connecting a second interposer having a second opening to the second circuitized card;
and
d) connecting a third circuitized card to the second interposer, wherein the third circuitized card, second circuitized card, and the second opening in the second interposer form a second cavity for containing at least one component.

Claim 52. (Unchanged) The method of claim 51 further comprising the step of placing at least one component in the second cavity.

Claim 53 (New) A package for containing electronic components, the package comprising:
a first circuitized card;
a second circuitized card;
an interposer interposed between the first and second circuitized cards, the interposer having an opening, the opening of the interposer and the first and second circuitized card forming a cavity for containing at least one electronic component
wherein the interposer, first circuitized card, and second circuitized card are circuitized multi-layer organic laminate cards.